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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,971	11/17/2003	Shahriar Ahmed	42P17289	5359

7590 04/05/2005
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EXAMINER

PHAM, THANHHA S

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,971

Applicant(s)

AHMED ET AL.

Examiner

Thanhha Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) 17-22 is/are withdrawn from consideration.
5) ☒ Claim(s) 7-16 is/are allowed.
6) ☒ Claim(s) 1-6 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/07/2005
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-16, drawn to a method for fabricating a bipolar transistor, classified in class 438, subclass 365.
 - II. Claims 17-22, drawn to a bipolar transistor, classified in class 257, subclass 511.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process invention I can be used made other and materially different product, for example, a bipolar transistor without a monocrystalline extrinsic base region relatively vertical sidewalls adjacent a monocrystalline link base, the extrinsic base region being more heavily doped than the adjacent link base region (see claims 1 and 17 for more details). Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

2. During a telephone conversation with Edwin Taylor on 03/01/2005 a provisional election was made without traverse to prosecute the invention of method, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Oath/Declaration

4. Oath/Declaration filed on 04/19/2004 has been considered.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: the intrinsic base region 13. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

Specification text paragraph [0030] line 5, typographical " the spacers 23" should be changed to "the spacers 32"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 2-3 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for “forming the sidewall spacers (32) on the emitter pedestal structure (28) and the etching includes isotropic etching so as to undercut sidewall spacers (32, fig. 9) on the emitter pedestal structure”, does not reasonably provide enablement for “the etching includes isotropic etching so as to undercut the emitter pedestal structure (28)”. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hamasaki et al. [US 5,250,448].**

Hamasaki et al. (figs 5's and cols. 1-9) discloses the claimed method for fabricating a bipolar transistor comprising:

forming an emitter region in a first epitaxial layer (10, fig. 5G, col. 5 lines 15-22 and col. 3 lines 60-62);

etching the first epitaxial layer (10) using an emitter pedestal structure (11, figs 5H-5I, col. 5 lines 25-36) as a masking member;

growing a second epitaxial layer (24, fig. 5G, col. 5 lines 37-40) on the first epitaxial layer (epitaxial layer 24 being grown on sidewalls of the epitaxial layer 10).

9. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Dunn et al. [US 6,617,220].

► With respect to claim 1, Dunn et al. (figs 5-8 & 12-13, cols. 1-8) discloses the claimed method for fabricating a bipolar transistor comprising:

forming an emitter region in a first epitaxial layer (base region 58 of 58i/60/58i, col. 5 lines 8-28 and col. 6 lines 51-54 & 17-31);

etching the first epitaxial layer (58i/60/58i, fig. 13) using an emitter pedestal structure (64) as a masking member; and

growing a second epitaxial layer (80, fig 12, col. 6 lines 40-55 and col. 5 lines 56-67) on the first epitaxial layer (58i/60/58i).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al. [US 6,617,220] as applied to claim 1 above in view of Naem [US 6,649,482].

► With respect to claim 4, Dunn et al. substantially discloses the claimed method including: forming a polysilicon layer (64) on an oxide layer (59) having an opening which exposes the emitter region (emitter region being formed in the base 58 when the emitter pedestal structure 64 is annealed and dopants are driven from the emitter pedestal structure 64 to the base 58); defining the emitter pedestal from the polysilicon layer (64); and forming sidewall spacers (66) on the emitter pedestal (64). Dunn et al does not expressly teach forming the sidewall spacers (66) of oxide.

However, selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle." 325 U.S. at 335, 65 USPQ at 301. See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious). See Naem as an evidence that shows using a oxide as a material for sidewall spacers (358, fig 3H, col. 6 lines 60-65) of emitter pedestal structure (354).

Therefore, at the time of invention, it would have been obvious for those skilled in the art to modify process of Dunn et al by using the oxide sidewall spacers as being claimed, per taught by Naem, as known material to provide appropriate protection to the emitter pedestal structure in the bipolar transistor.

► With respect to claim 5, Dunn et al. (col. 4 lines 32-49 and col. 5 lines 21-27) discloses the first epitaxial layer is a silicon-germanium layer.

► With respect to claim 6, Dunn et al (col. 5 lines 56-67 and col. 6 lines 40-54) discloses the second epitaxial layer (raise extrinsic base region) is a silicon-germanium layer.

Allowable Subject Matter

12. Claims 7-16 are allowed.

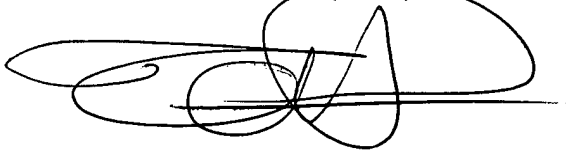
13. The following is an examiner's statement of reasons for allowance: Recorded Prior Art fails to disclose or suggest the combination of the process steps of fabricating a bipolar transistor as recited in the base claim 7 including forming sidewall spacers on the emitter pedestal structure over the first epitaxial layer; etching the first epitaxial layer including undercutting the sidewall spacer and growing a second epitaxial layer on the first epitaxial layer.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thanhha Pham', with a large, stylized loop at the end.

Thanhha Pham
Patent Examiner
Patent Examining Group 2800